

# National and Regional Strategies to Reduce Diesel Emissions



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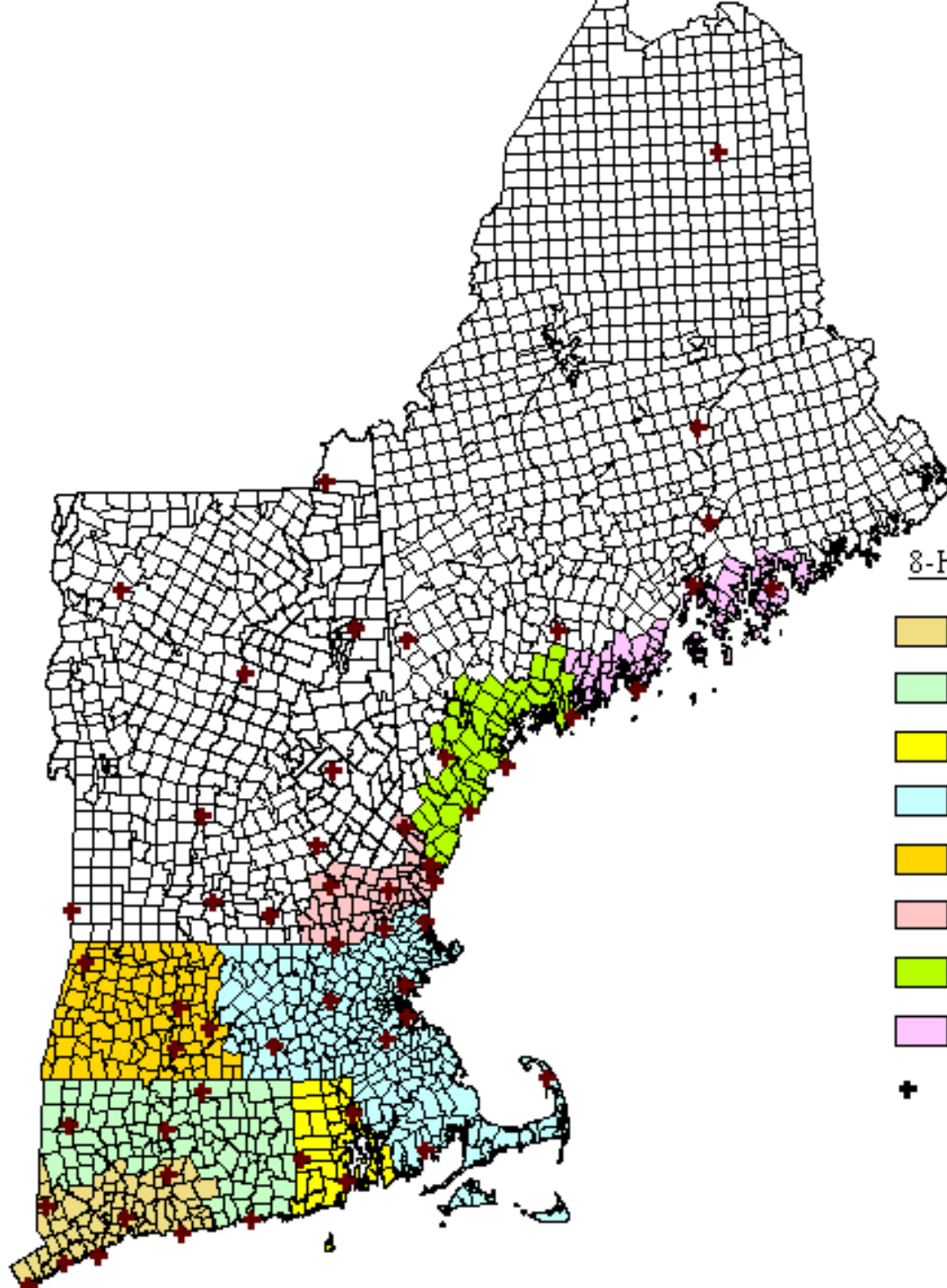
# Why Focus on Reducing Diesel Pollution?

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









- New England has some of the highest asthma rates in the country – all six New England states have childhood asthma rates above 10 percent
- All of CT, MA and RI, and coastal areas of ME and NH do not meet the ozone standard
- Portions of southwest CT designated nonattainment for fine particles (i.e., PM<sub>2.5</sub>)
- Diesel engines are significant contributors to air pollution, especially in urban areas
- There are cost-effective ways to reduce pollution from existing diesel engines

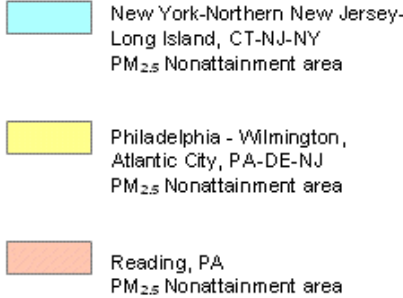
# Ozone Nonattainment Areas in New England



## 8-HOUR OZONE NON-ATTAINMENT AREAS

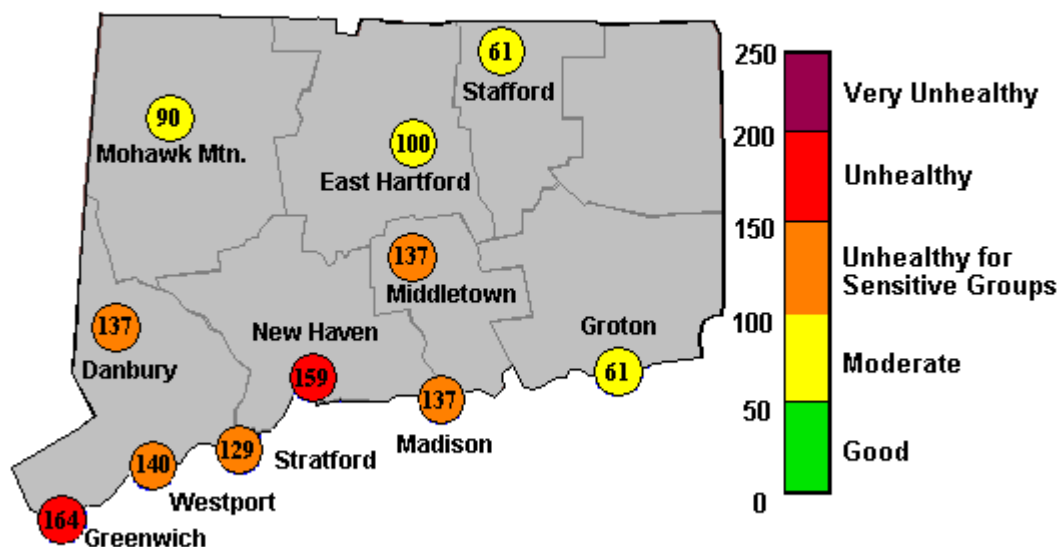
-  NEW YORK-N. NEW JERSEY-LONG ISLAND, NY-NJ-CT
-  GREATER CONNECTICUT, CT
-  PROVIDENCE (ALL RI), RI
-  BOSTON-LAWRENCE-WORCESTER (E. MA), MA
-  SPRINGFIELD (W. MA), MA
-  BOSTON-MANCHESTER-PORTSMOUTH (SE), NH
-  PORTLAND, ME
-  HANCOCK, KNOX, LINCOLN AND WALDO COS, ME
-  2003 OZONE MONITORING STATION

# in the Northeast



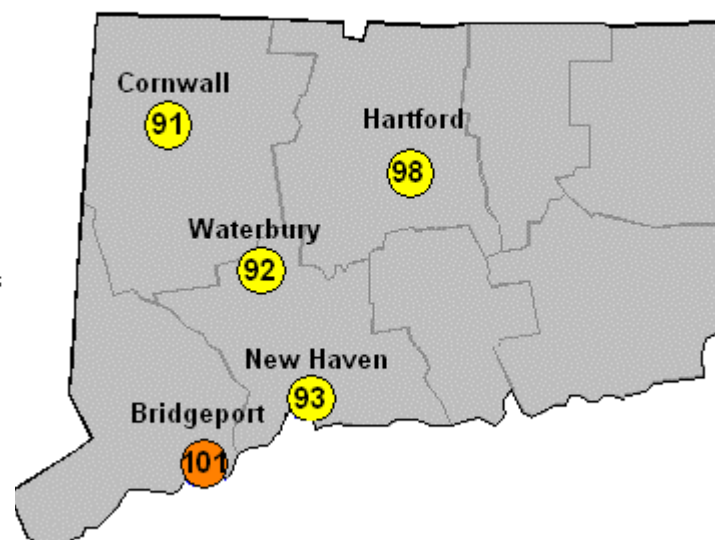
# Unhealthy Air Quality Continues to Affect Connecticut

## Connecticut Peak Ozone Air Quality Index (AQI)



Peak AQI for August 13, 2005

## Connecticut Peak PM 2.5 Air Quality Index (AQI)



PEAK AQI August 13, 2005

# EPA's Clean Diesel Campaign - Regulations for New Engines

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- Nationally, EPA has set standards for **new diesel engines and diesel fuel** that will result in the use of advanced pollution control technology
  - In Dec. 2000, EPA set very stringent standards for new heavy-duty trucks and buses that take full effect beginning in 2007
  - In May 2004, EPA set very stringent standards for new nonroad diesel engines which will take effect beginning in 2008
  - The new standards will cut PM and NOx emissions from new diesel engines by over 90 percent
- These regulations will result in very large public health and environmental benefits:
  - By 2030, particulate matter reduced by ~250,000 tons/year, nitrogen oxides by ~4 million tons/year
  - Annual benefits expected to exceed \$150 billion, with a cost of approximately \$7 billion

# EPA's Clean Diesel Campaign - Voluntary Diesel Retrofit Program

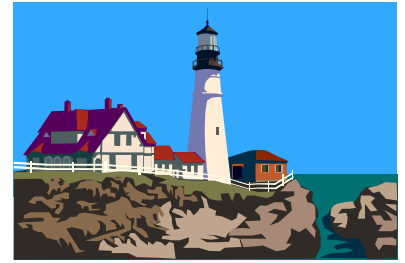
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- EPA is implementing a robust voluntary diesel retrofit program to reduce pollution from **existing diesel engines** through the use of pollution controls and cleaner fuels
- Five sectors targeted: School Buses, Ports, Construction, Freight, Agriculture
- Retrofit options include:
  - Cleaner diesel fuel
    - Low sulfur diesel fuel (300 ppm) reduces PM emissions 10-15 percent compared to non-road diesel fuel
    - Ultra low sulfur diesel fuel (15 ppm) reduces PM emissions an additional 5-10 percent beyond LSD
  - Advanced pollution controls
    - Diesel Oxidation Catalyst reduces PM emissions 20 – 40%
    - Diesel Particulate Matter Filter used in combination with ULSD reduces PM emissions 90 percent

# Reducing Diesel Emissions in New England

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- Numerous innovative programs are underway to reduce diesel pollution from transportation and construction
- EPA, the states and our local partners are working to reduce emissions from diesel vehicles through:
  - Anti-idling education and enforcement
  - Diesel retrofits and cleaner fuels
  - Heavy-duty vehicle testing



# Anti-Idling Rules in New England

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- EPA Region 1 has developed educational materials to discourage idling
- CT, MA & NH have anti-idling rules
- The CT & MA rules are included in the state air quality plan, and enforceable by EPA
- EPA has enforced the Massachusetts rule and imposed fines against:
  - Eleven bus operators at Logan Airport
  - Massachusetts Bay Transportation Authority

# Reducing School Bus Idling in New England

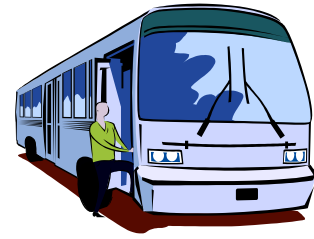
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- Every New England state has a program to reduce school bus idling that includes:
  - Creative materials to educate and involve drivers and school officials in local anti-idling campaigns
  - Direct outreach to school superintendents
  - Recommendations to limit idling on school grounds
- Connecticut, Maine, and New Hampshire have signed anti-idling agreements with their school transportation associations
- Massachusetts has developed a video for school bus drivers and is implementing an initiative that includes driver training and enforcement of the state's 5 minute idling law
- In Rhode Island, 13 out of 36 school districts have adopted formal anti-idling policies, and more than 400 school bus drivers have received anti-idling training

# Urban Bus Retrofits in New England

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- Massachusetts Bay Transportation Authority (MBTA)
  - Entire fleet of 980 buses has either been retrofitted w/filters and is using ULSD or runs on compressed natural gas
    - Result of Central Artery mitigation commitments
- Rhode Island Public Transit Authority (RIPTA)
  - Using ULSD in 156 buses and working to install filters on as many buses as technologically feasible
    - Funded through enforcement settlement agreement and with CMAQ funds
- Connecticut Transit – Stamford Division
  - 31 buses equipped w/filters and using ULSD
    - Funded with CMAQ funds

# **School Bus Retrofit Projects in New England**

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- **EPA's Clean School Bus USA Grants (FY'03 & 04)  
(Decisions pending on \$7.5 million FY05 funds)**
  - **Statewide, Maine – 450 buses**
  - **Medford, Massachusetts – 70 buses**
  - **Stamford, Connecticut – 35 buses**
  - **Manchester/Nashua, New Hampshire – 45 buses**
  - **Warwick, Rhode Island – 70 buses**
- **Funded through EPA or State Enforcement Settlement Agreements**
  - **Boston, Massachusetts – 600 buses**
  - **Norwich, Connecticut – 42 buses**
  - **New Haven, Connecticut – 180 buses**
  - **Hartford, Connecticut – 200 buses**
  - **Bridgeport, Connecticut – 200 buses**
- **National EPA settlement with Toyota Motor Corporation - 2003**
  - **\$20 million in school bus retrofit projects nationally, including**
    - **Yarmouth & Biddeford, Maine**
    - **Newington, Connecticut**

# Construction Retrofit Projects in New England

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- **Central Artery (“Big Dig”) Project in Boston**
  - 200 construction vehicles
- **Q-Bridge on I-95 in New Haven, CT**
  - 65 vehicles
- **Massachusetts Highway Department**
  - Effective March 2005, **all** construction contracts include requirements for retrofitted equipment
  - This will have a significant impact statewide
    - For example in 2003, MassHighway invested \$416 million in 475 road and bridge construction projects
- **MBTA has, since 2001, included requirements for retrofits in all construction contracts**
  - More than 40 projects in Greater Boston using retrofitted equipment

# Other Retrofit Projects in New England

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- **Commuter Trains – Boston**
  - All 55 MBTA Commuter Trains are using cleaner low sulfur diesel on road fuel
  - Funded through 2 EPA NE enforcement settlement agreements
- **Shuttle Buses - Boston**
  - 17 buses serving Longwood Medical area hospitals
  - First privately funded retrofit project in New England
- **Tourist Trolleys - Boston**
  - First tourist trolley retrofit project in the northeast
  - 35 trolleys (Funded through an EPA grant)
- **City of Cambridge/Massachusetts Institute of Technology Vehicles**
  - 32 vehicles with a range of retrofit technologies including, oxidation catalysts, crankcase filters, and particulate matter filters, as well as cleaner fuels, (ultra-low sulfur diesel fuel, biodiesel, and cetane enhancers)
- **Port of Boston - Conley Container Terminal Vehicles**
  - 36 vehicles operating at the port equipped with oxidation catalyst

# Heavy-Duty Vehicle Testing

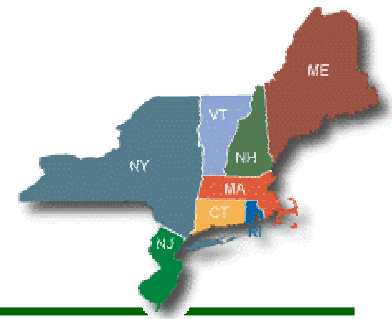
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- In Massachusetts, all heavy-duty diesel vehicles (weighing more than 10,000 pounds) must undergo an emissions test every other year.
- Connecticut, Maine, New Hampshire, and Rhode Island conduct roadside testing



# Northeast Diesel Collaborative

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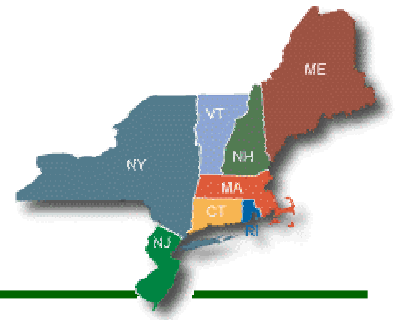


- New joint venture of EPA Region 1, Region 2, NESCAUM and the eight Northeast States to reduce emissions from diesel vehicles
- Builds upon a long and successful history of cooperation among Region 1, Region 2, NESCAUM and the northeast states to address air quality challenges
- Will pursue sector-based approach to reduce emissions from
  - Trucks
  - Transit and School buses
  - Construction equipment
  - Locomotives
  - Marine engines



# Goals of Northeast Diesel Collaborative

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- Launch additional local diesel retrofit initiatives
- Increase enforcement of idling restrictions
- Expand construction retrofit requirements in urban areas and to private sector projects
- Expand transit bus retrofits to other transit authorities
- Retrofit schools buses in EJ areas, establish retrofit/clean purchasing requirements for new school buses across the Northeast
- Retrofit additional fleets, establish retrofit/clean purchasing requirements for municipal fleets across the Northeast

# Potential Strategies

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- **Locomotives**

- Can be a significant source of urban air pollution
  - Large diesel engines, generally not well controlled
- NESCAUM study of the contribution of locomotives to local air pollution in New Haven

- **Effective strategies to reduce locomotive emissions already exist**

- **Cleaner Fuel**

- Low Sulfur Diesel (300 ppm) fuel
  - Reduces PM emissions 10-20 percent
  - In early 2005, MBTA paying only approx. 1 cent per gallon more than high sulfur fuel (3,000 ppm)
- Ultra Low Sulfur Diesel Fuel
  - Additional 5-10 percent reduction in PM emissions

# Potential Strategies

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- **Cleaner Engines**

- Rebuild engines to Tier 0 (reduces NOx by approx. 33%)
- Purchase cleanest available engines
- Retrofit
  - Demonstration Project underway in Boston to test a Diesel Oxidation Catalyst on a Commuter Train
  - Expected to reduce PM emissions 15-35%

- **Idle Reduction**

- Locomotive Auxiliary Power Units (APUs)
  - Can reduce idling fuel consumption by up to 85%, saving up to 20,500 gallons of fuel per year
  - 30 CSX switchyard locomotives in MA and CT have installed APUs to reduce idling

# Diesel Related Funding Opportunities

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- **EPA's Appropriations Act for FY 06 (signed Aug. 2, 2005)**
  - \$5 million for National Clean Diesel Campaign
  - \$7 million for Clean School Bus USA
- **Transportation Bill**
  - Diesel retrofits eligible for CMAQ funds
  - Authorizes \$55 million for Clean School Bus USA program
- **Energy Bill**
  - Diesel Truck and Fleet Modernization – Authorizes \$100 million over three years
  - Reducing Diesel Emissions – Authorizes \$1 billion over 5 years
  - Clean School Bus USA – Authorizes \$55 million per year FY06 and FY 07 (same as Transportation Bill)
  - Anti-Idling for trucks and locomotives - Authorizes \$140 million over three years through EPA administered grant programs

# For More Information...

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- [www.epa.gov/ne/eco/diesel](http://www.epa.gov/ne/eco/diesel)
- [www.epa.gov/otaq/retrofit](http://www.epa.gov/otaq/retrofit)
- [www.epa.gov/cleanschoolbus](http://www.epa.gov/cleanschoolbus)
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